s18quiz: EXP LOG (Solution v145)
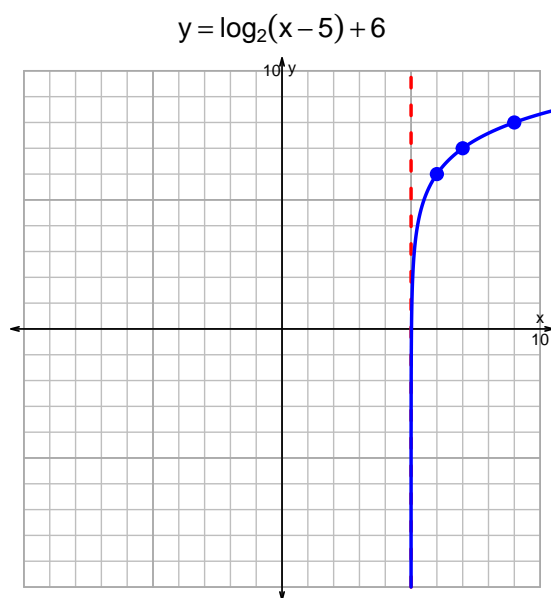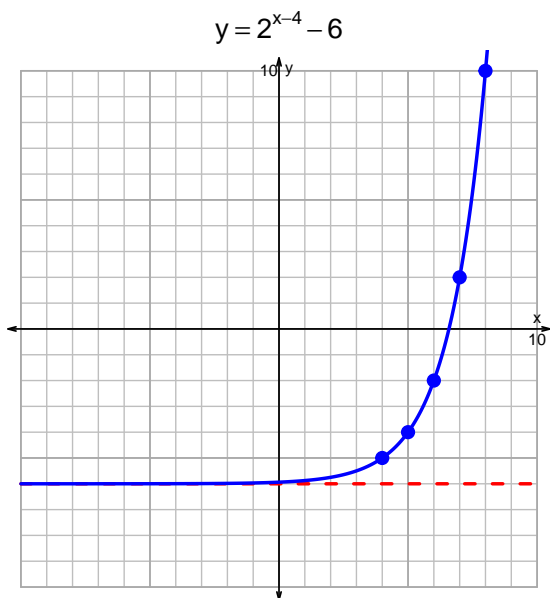
1. Graph $y = 2^{x-4} - 6$ and $y = \log_2(x - 5) + 6$ on the grids below. Also, draw any asymptotes with dotted lines.

$$y = 2^{x-4} - 6$$

$$y = \log_2(x - 5) + 6$$

2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$-11 = \left(\frac{-7}{3}\right) \cdot 2^{-4t/5}$$

Divide both sides by $\frac{-7}{3}$.

$$\frac{11 \cdot 3}{7} = 2^{-4t/5}$$

Take log, base 2, of both sides.

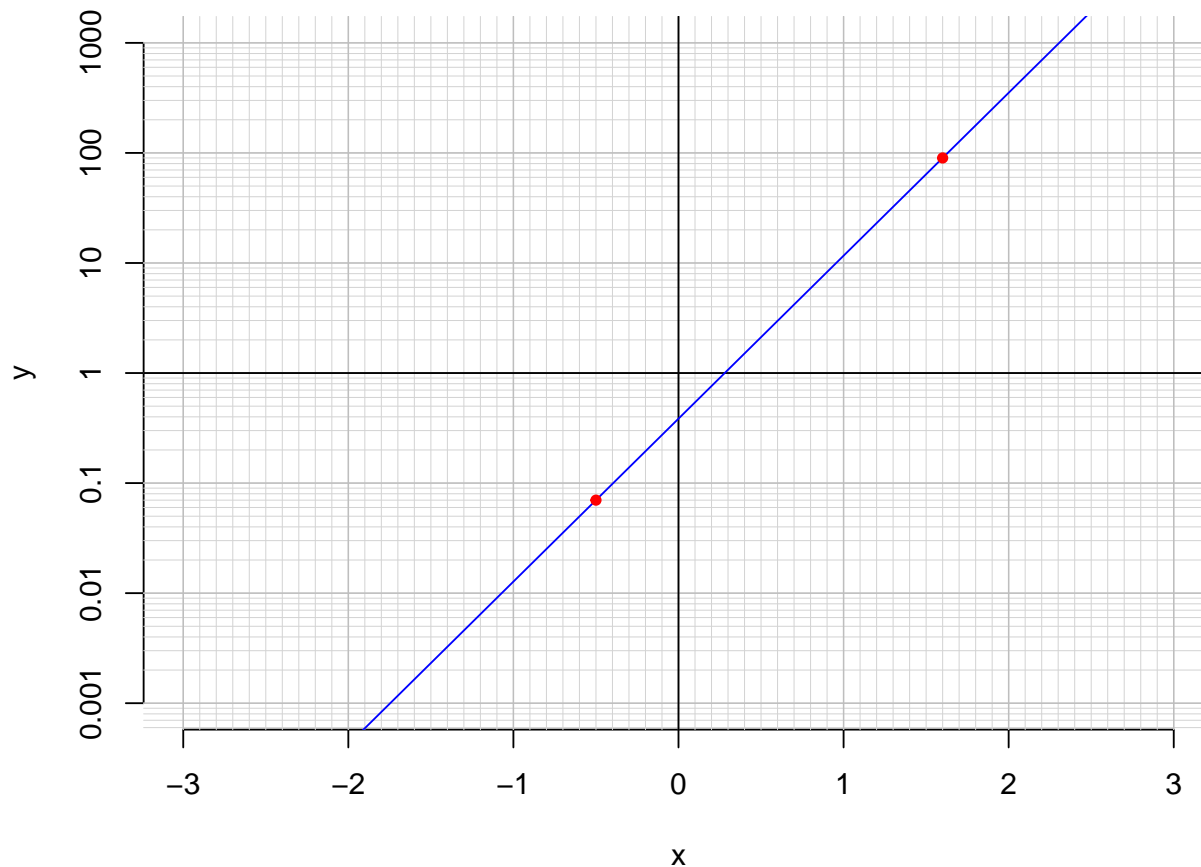$$\log_2\left(\frac{11 \cdot 3}{7}\right) = \frac{-4t}{5}$$

Divide both sides by $\frac{-4}{5}$.

$$\frac{-5}{4} \cdot \log_2\left(\frac{11 \cdot 3}{7}\right) = t$$

Switch sides.

$$t = \frac{-5}{4} \cdot \log_2\left(\frac{11 \cdot 3}{7}\right)$$

3. An exponential function $f(x) = 0.385 \cdot e^{3.41x}$ is graphed below on a semi-log plot.

a. Using the plot above, evaluate $f(1.6)$.

$$f(1.6) = 90$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{1}{3.41} \cdot \ln\left(\frac{x}{0.385}\right)$$

c. Using the plot above, evaluate $f^{-1}(0.07)$.

$$f^{-1}(0.07) = -0.5$$